

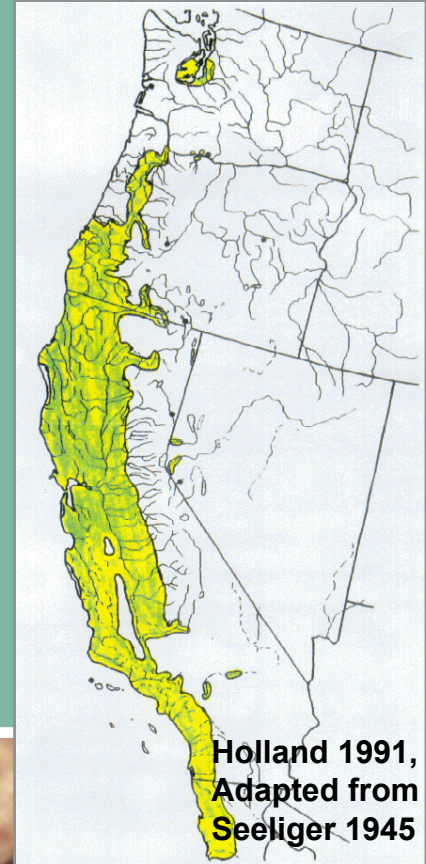
Distribution and Status of the Western Pond Turtle (*Emys marmorata*) in the San Diego MSCP and Surrounding Areas, 2002-2003.



Western Pond Turtle (*Emys marmorata*)

Background- Western Pond Turtle Decline in Southern California

- Only turtle native to coastal California.
- Historically occurred in most major coast facing drainages from northern Baja to Washington (Jennings and Hayes 1994).
- Work by Brattstrom and Messer (1988) suggested only a few populations of pond turtles remained in Southern California and those that did were comprised of few individuals.



Background- Western Pond Turtle Decline in Southern California

- Principal cause of pond turtle decline is riparian habitat loss and alteration.
- Non-native turtles thought to out-compete for resources (Spinks et al. 2003; Cadi & Joly 2003) and transmit diseases and parasites (Powler and Miller 1999).



Red-eared Slider



Background- Western Pond Turtle Decline in Southern California

- Other introduced species, such as large mouth bass and bullfrogs are thought to have impacted pond turtle populations.
- Decline has led to Species of Concern status (USFWS & CDFG) and coverage by the San Diego MSCP.



Bullfrog



Large-mouth Bass

Objectives

- Identify potential pond turtle habitat and perform surveys to assess habitat suitability.
- Determine the current status and distribution of the western pond turtle through visual and trapping surveys.



Objectives

- Identify human disturbances and other negative impacts to pond turtles and pond turtle habitat at each survey site.
- Provide management recommendations based on findings.



Bullfrog



Scope of Work

- Most sites surveyed are covered by the San Diego MSCP.
- USGS provided additional funding to conduct surveys outside the scope of this project.
- Most additional sites fell within the boundaries of the MSCP or just beyond MSCP boundaries.

Types of Surveys

- Visual for Habitat Suitability and Turtles
- Trapping



Habitat Assessment

- Water
- Aquatic Refugia
- Streamside Refugia
- Aquatic Basking Sites
- Upland Nesting Habitat



Western Pond Turtle

Trapping

- Trapped May – October
- Trapped 2 – 4 days
- Number of traps depended on site size
- Traps checked daily
- Recorded all captured species



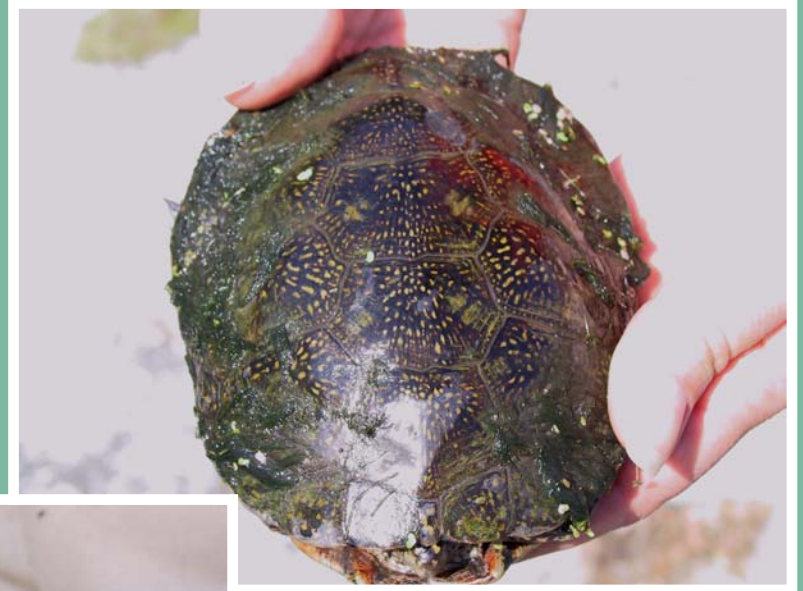
Western Pond Turtle

Pond Turtle Processing

- Shell measurements
- Weight
- Sex
- Deformities
- Injuries
- Assigned unique ID
- Tissue for genetics
- Photographs



Western Pond Turtle (*Emys marmorata*)



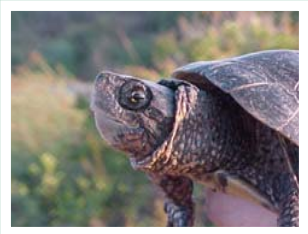
Summary of Effort

- 65 sites (7 major drainages) surveyed
- 41 of 65 sites trapped
 - 45,477 trap hours
 - 1,895 trap days



Western Pond Turtle

Results- Total Turtle Detections (Visual and Trapping Surveys)



Western Pond Turtle

- Pond Turtles

- 73 pond turtles at 9 of 65 sites
- Pond turtles found in 6 of the 7 major drainages



Non-native Turtles

- Non-native Turtles (6 species, 9 sub)

- 263 non-native turtles at 24 of 65 sites
- Non-native turtles found in 7 of the 7 major drainages

Pond Turtles Detected at 9 Locations

6 Locations Within MSCP Boundaries		Total # Detected	Peterson Mark Recapture			
			Pop Est (N)	Poisson Upper 95% CL	Poisson Lower 95% CL	True Lower Limit
1	Sycuan Peak Ecological Reserve, Sweetwater River	42	38	80.91	22.77	30
2	4S Ranch	9	15	29.45	4.06	9
3	Los Penasquitos Canyon Preserve, pond	3				3
4	Los Penasquitos Canyon Preserve, creek	2				2
5	Santee Lakes	1				1
6	Lake Murray	1				1

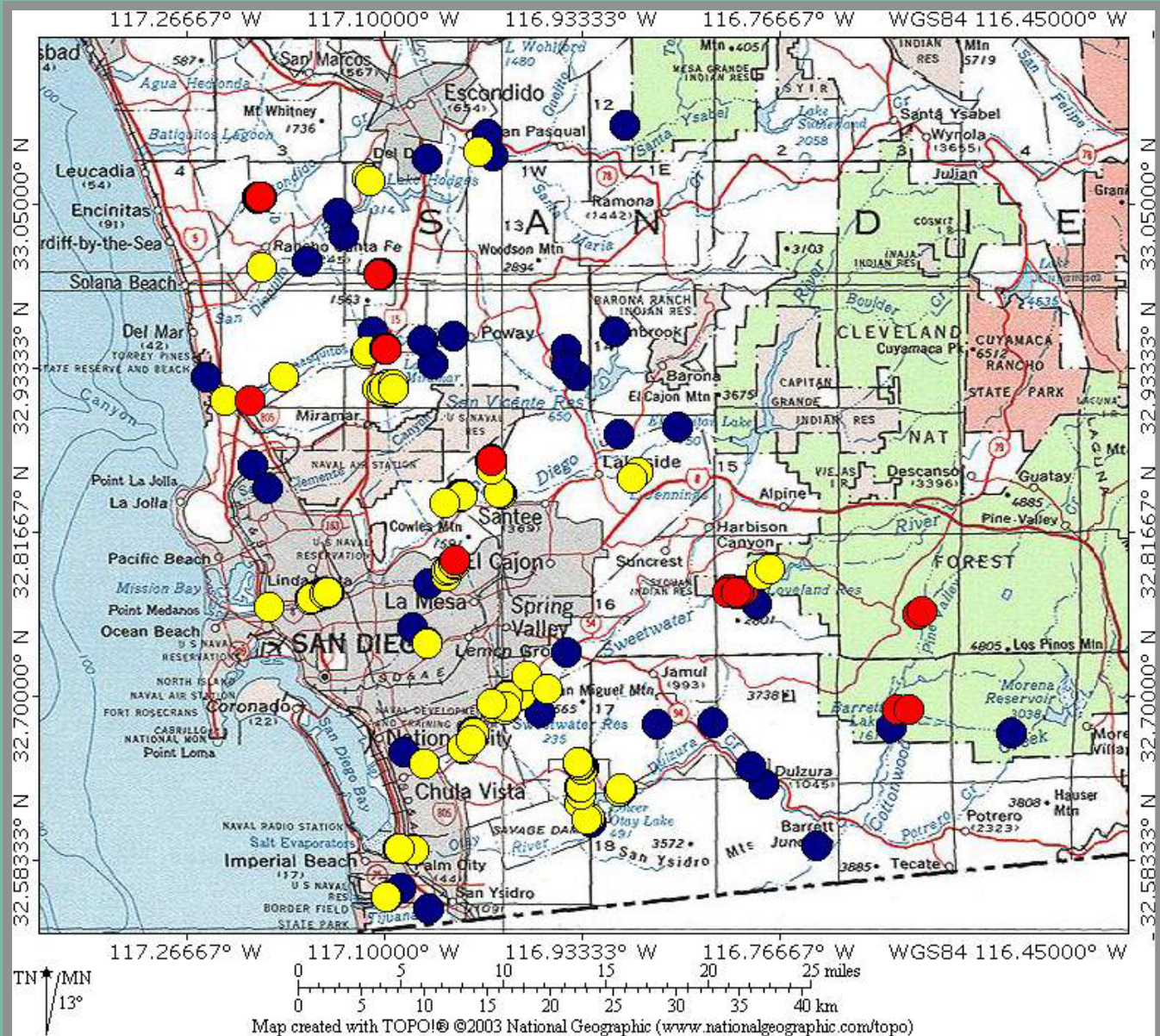
Pond Turtles Detected at 9 Locations

3 Locations Outside of MSCP Boundaries		Total # Detected	Peterson Mark Recapture			
			Pop Est (N)	Poisson Upper 95% CL	Poisson Lower 95% CL	True Lower Limit
7	Escondido Creek	5				4
8	Pine Valley Creek	3				3
9	Barrett Lake	2				1

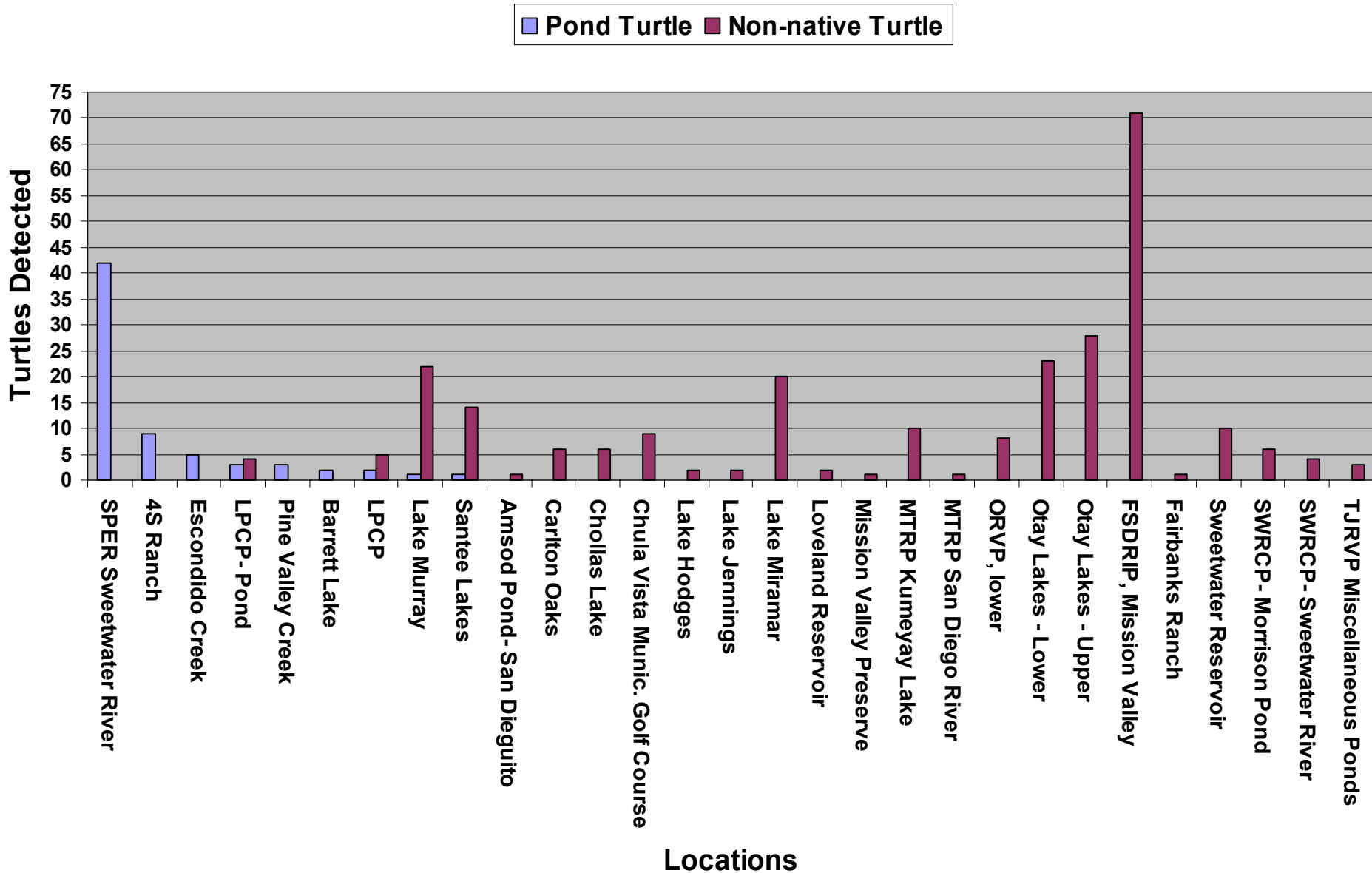
- Brattstrom & Messer (1988) viable population is 30 or more turtles
- Holland (1991) closer to 50 turtles

Turtle Locations

-  Pond Turtles
-  Non-Native Turtles
-  No Turtles

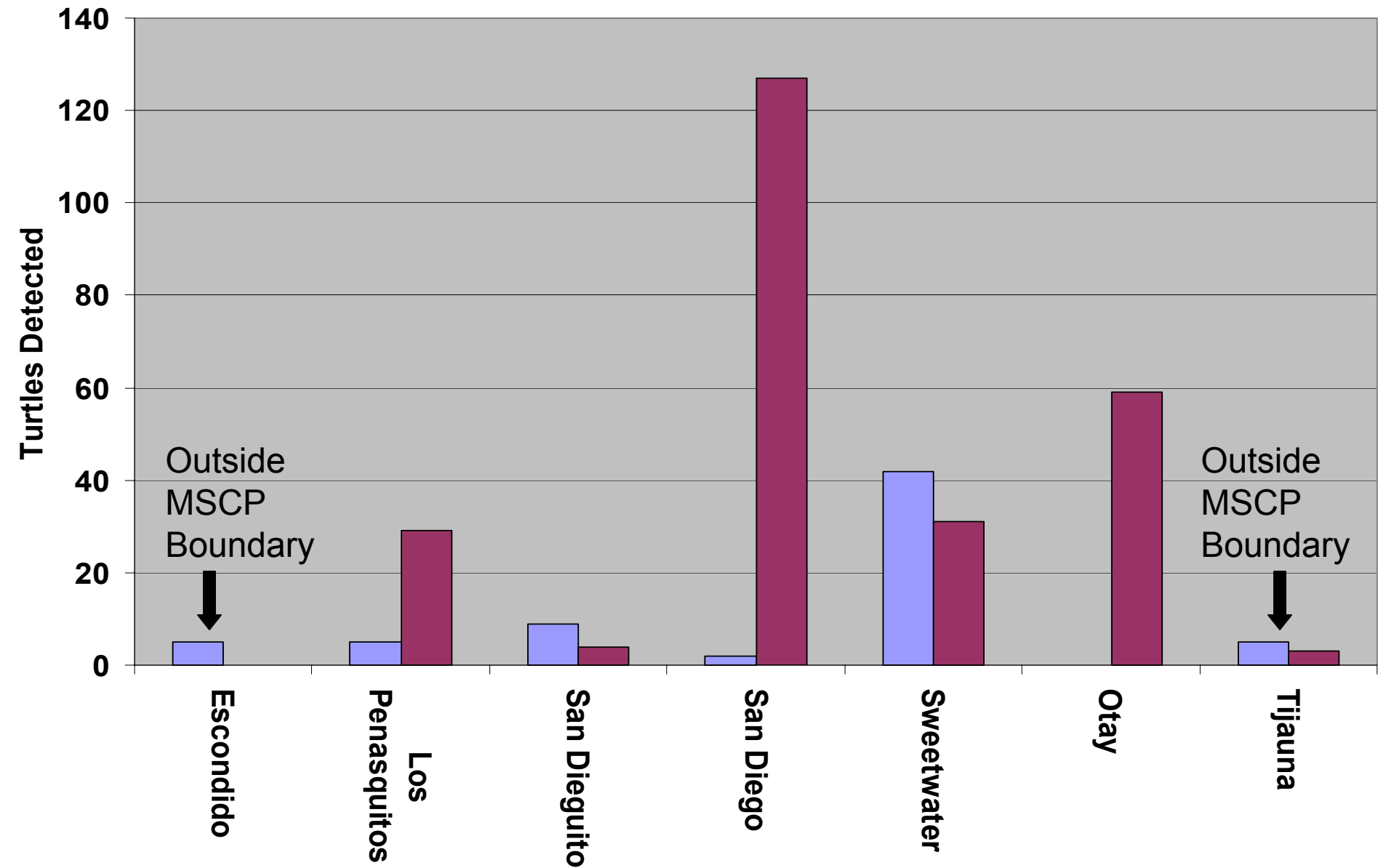


Total Pond Turtle and Non-native Turtle Detections per Location (Sites with Turtles)



Total Pond Turtle and Non-native Turtle Detections per Watershed

Pond Turtles Non-native Turtles



Additional Pond Turtle Results

- Few females captured
 - At Sycuan Peak ER (8 of 30)
 - Escondido Creek (2 of 4)
 - Barrett Lake (1 of 1)
 - Santee Lakes (1 of 1)
- Only one gravid female at Sycuan Peak ER- may be due to timing of surveys
- No Juveniles were detected

Habitat Type and Human Access

■ Habitat Type:

- Natural- ponds, wetlands, etc.
- Modified Natural- dammed or channelized systems, etc.
- Artificial- manmade ponds, community lakes, etc.

■ Human Access:

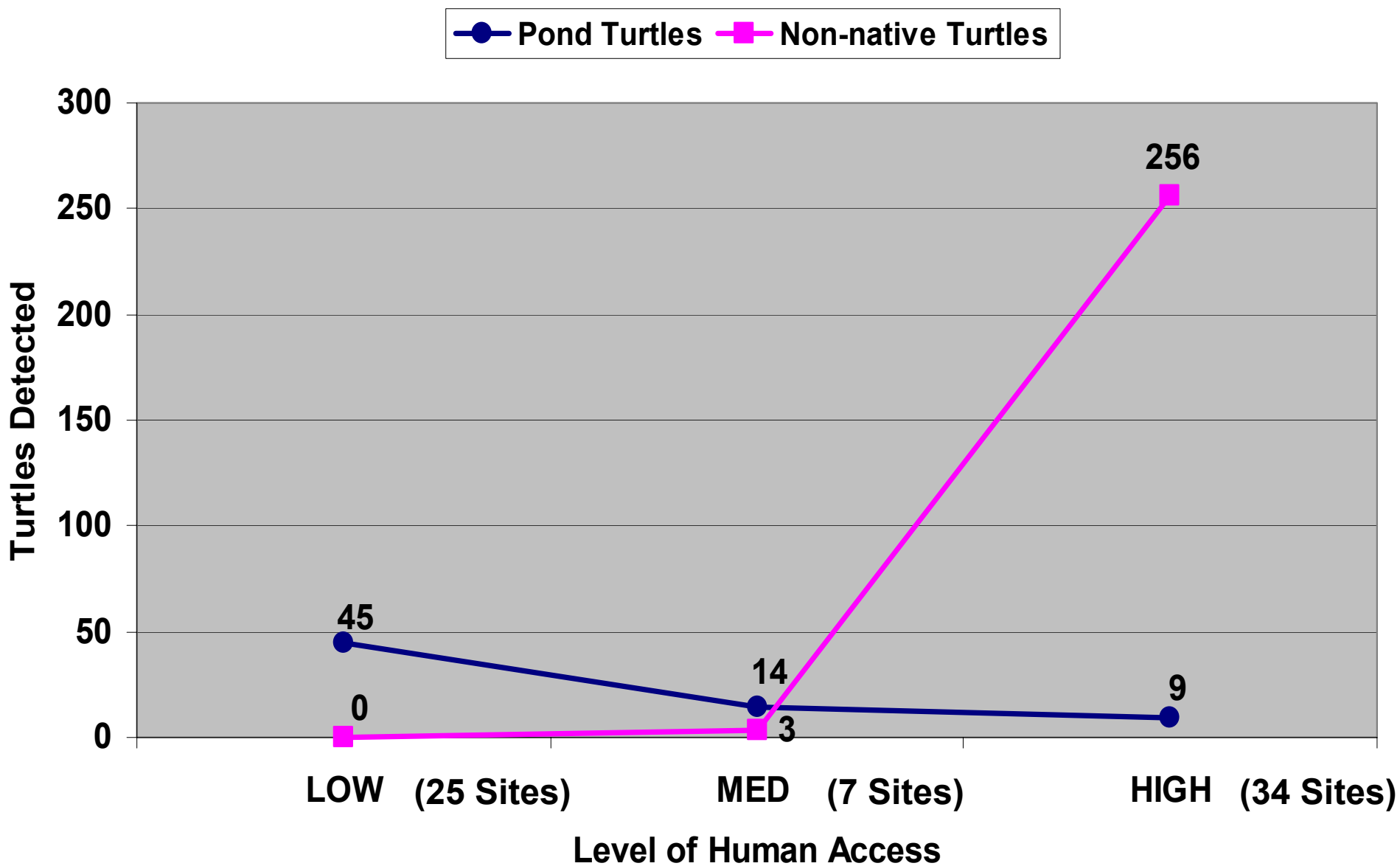
- Low- wilderness areas, ecological reserves, etc.
- Medium- restricted reservoirs, isolated parks, etc.
- Heavy- fishing reservoirs, heavily recreated public parks, etc.



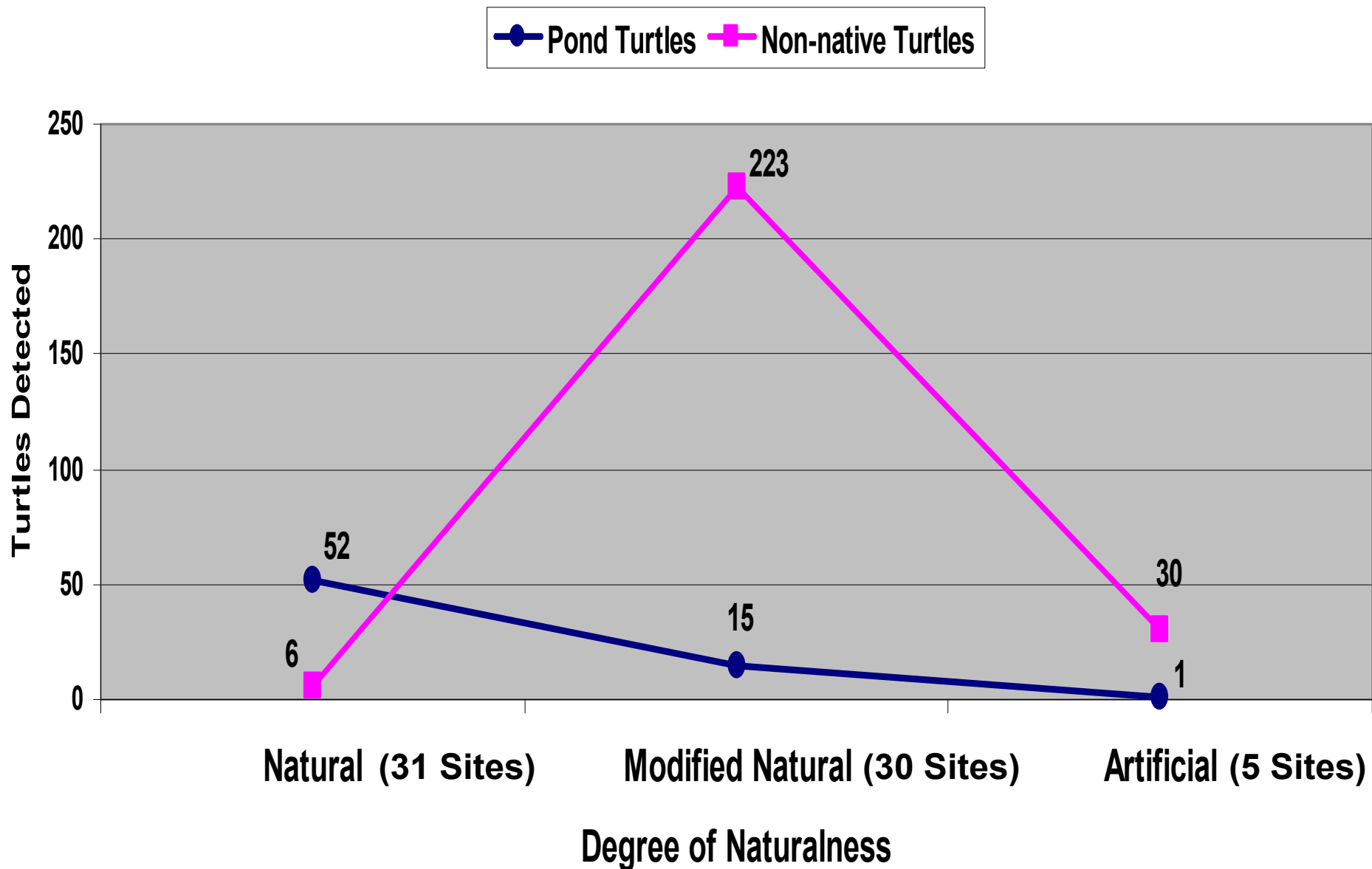
Expected Results- Pond Turtle and Non-native Turtle Detections

	Natural	Modified Natural	Artificial
Heavy Access	WPT ↓, Non-Native ↑	WPT ↓, Non-Native ↑	WPT 0, Non-Native ↑
Low Access	WPT ↑, Non-Native 0	WPT ↑, Non-Native ↓	WPT 0, Non-Native 0

Pond Turtle & Non-native Turtle Detections and Level of Human Access



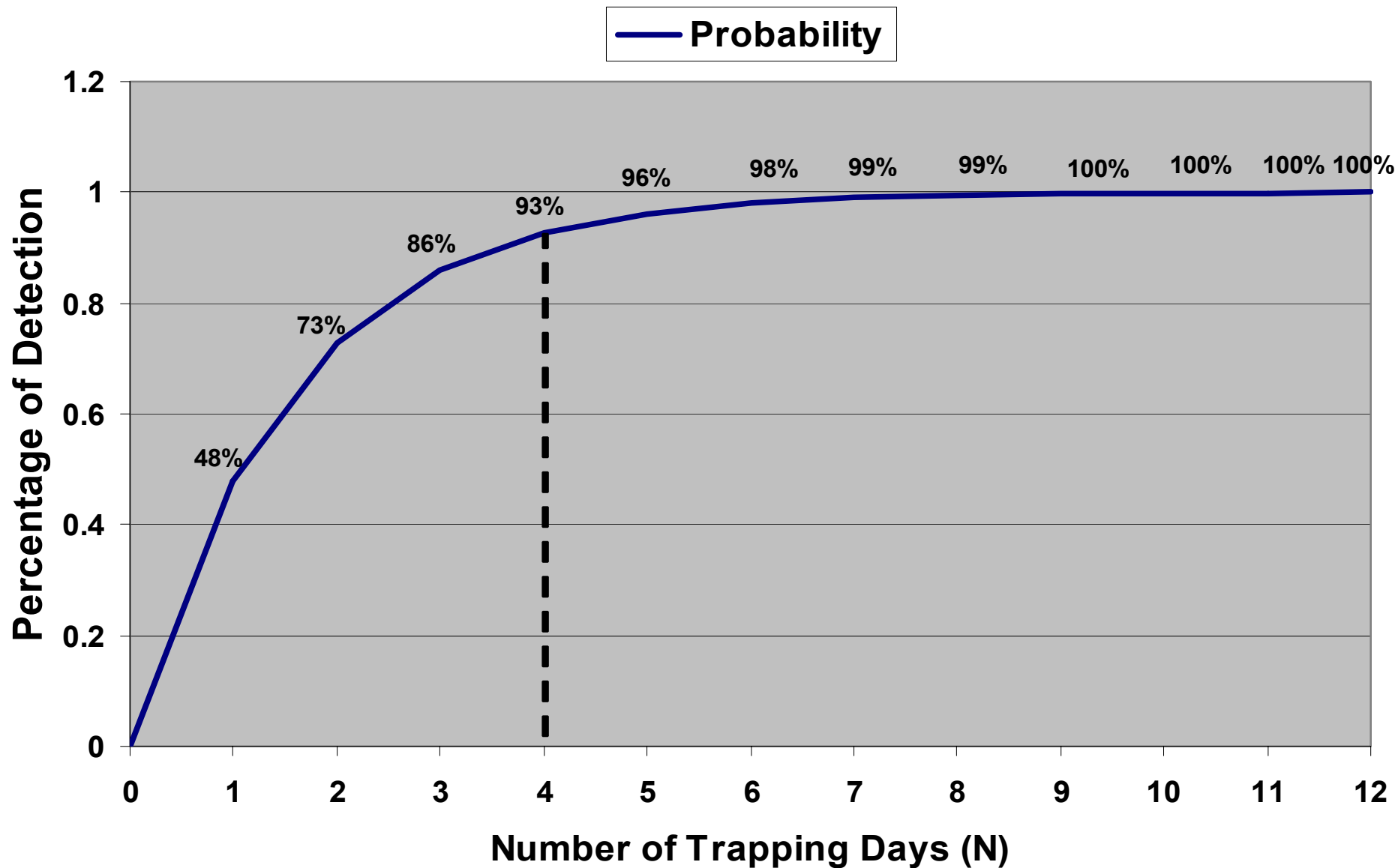
Pond Turtle and Non-native Turtle Detections and Naturalness of Habitat



Pond Turtle Trapping Detectability- Program PRESENCE Software

Number of Sites with Pond Turtles	9
Number of Sites Trapped	41
Proportion of Sites Occupied	0.2299
Standard Error	0.081145
Detection Probability	0.4797

Detection Probability of Pond Turtles After N trapping Days



Monitoring and Management Recommendations

- Resurvey sites with known populations to get a better understanding of population status.
 - 4S Ranch- immediately
 - Los Penasquitos Canyon Preserve
 - Lake Murray



Monitoring and Management Recommendations

- Survey or resurvey known or possible historic locations with suitable habitat to verify they no longer occur.
 - Lake Hodges
 - Golem Land Trust
 - Lusardi Creek Preserve
 - San Vicente Creek
 - MTRP San Diego River & Alvarado Creek
 - Alvarado Creek, Adobe Falls
 - Otay River Valley



Monitoring and Management Recommendations

- Periodically assess the extent and quality of pond turtle habitat (aquatic and terrestrial).
 - 4S Ranch- begin immediately
 - Los Penasquitos CP
 - Sycaun Peak ER
 - Escondido Creek



Monitoring and Management Recommendations

- Expand the abundance and range of known populations through restoration or creation of wetland habitats.

Includes:

- Restoration of hydrologic regime
- Removal of invasive plant species
- Creation of deeper pools in riparian systems



Monitoring and Management Recommendations

- Remove non-native predatory species from locations with pond turtles, monitor the effectiveness of eradication techniques and measure benefits to pond turtles.
 - 4S Ranch
 - Los Penasquitos CP
 - Sycuan Peak ER



Monitoring and Management Recommendations

- Remove non-native turtles from locations with pond turtles.

A sample of non-native turtles showed (prelim. results):

- Large number of intestinal parasites
- Large number of leeches
- Anemia
- Emaciation



Monitoring and Management Recommendations

- Monitor urban run-off and water quality at locations with pond turtles.
 - 4S Ranch lower pond- immediately identify source of pollution (important to monitor as development progresses)



Monitoring and Management Recommendations

- Use radio-telemetry to quantify the extent of upland habitat use, including over-wintering and nesting. This should include locating nests, identifying nest site characteristics and monitoring reproductive success.
 - Little is known about upland movement in Southern California
 - 4S Ranch- immediately
 - Los Penasquitos CP



Monitoring and Management Recommendations

- Set aside important upland areas by limiting human recreation to areas used by pond turtles and where possible, limit recreation in wetland habitats, especially fishing.
- Garber & Burger (1995) saw a 100% decrease in wood turtles (*Clemmys insculpta*) over a 10 year period after areas were opened to recreation.
- 4S Ranch- immediately.
- Los Penasquitos CP
- Escondido Creek



**Fish Hook
Embedded
in
Esophagus**



Red-eared Slider captured in Mission Valley (FSDRIP)

Monitoring and Management Recommendations

- Install interpretative signs in public areas outlining the ramifications of releasing pet turtles and other non-native pets and emphasizing that it is also illegal (CDFG Code Section 2116-2126).
 - 4S Ranch
 - Los Penasquitos CP
 - Mission Trails Region Park



Monitoring and Management Recommendations

- Work with other organizations to provide outreach on the negative impacts of releasing pets and offer alternative ways of getting rid of unwanted pets.
 - Turtle and Tortoise Society & Herpetological Society- adopt unwanted pets, outreach at events
 - Pet Stores- educate consumers, unwanted turtle return policy



Monitoring and Management Recommendations

- Explore the possibility of captive rearing and reintroduction to maintain or enhance extant populations or reintroduce where extinct.
 - Possible source population: Sycuan Peak ER
 - Possible restoration sites: Ponds at Rancho Jamul ER, Mission Trails, Los Penasquitos CP, 4S Ranch



Non-native Turtle Species Captured



Red-eared Slider (*Trachemys scripta elegans*)



Undetermined Slider (*Trachemys scripta* spp.)



Yellow-bellied Slider (*Trachemys scripta scripta*)



Mud Turtle (*Kinosternon* spp.)

Non-native Turtle Species Captured



Western Painted Turtle (*Chrysemys picta bellii*)



Eastern Painted Turtle (*Chrysemys picta picta*)



Southern Painted Turtle (*Chrysemys picta dorsalis*).



Spiny Softshell (*Apalone spiniferus*)

Exotic Turtle Species Captured



False Map Turtle (*Graptemys pseudogeographica*)



Mississippi Map Turtle (*Graptemys pseudogeographica kohnii*)



Snapping Turtle (*Chelydra serpentina*)

Other Non-native Species Captured



Micropterus salmoides



Xenopus laevis



Lepomis macrochirus & *Lepomis cyanellus*



Rana catesbeiana



Procambrius clarkii

Acknowledgements

- California Department of Fish and Game
- County of San Diego
- City of San Diego
- US Fish and Wildlife Service
- The San Diego Turtle and Tortoise Society
- The San Diego Natural History Museum
- USGS
- And many others!



